Simultaneous occurence of medullary and papillary thyroid microcarcinomas - case report

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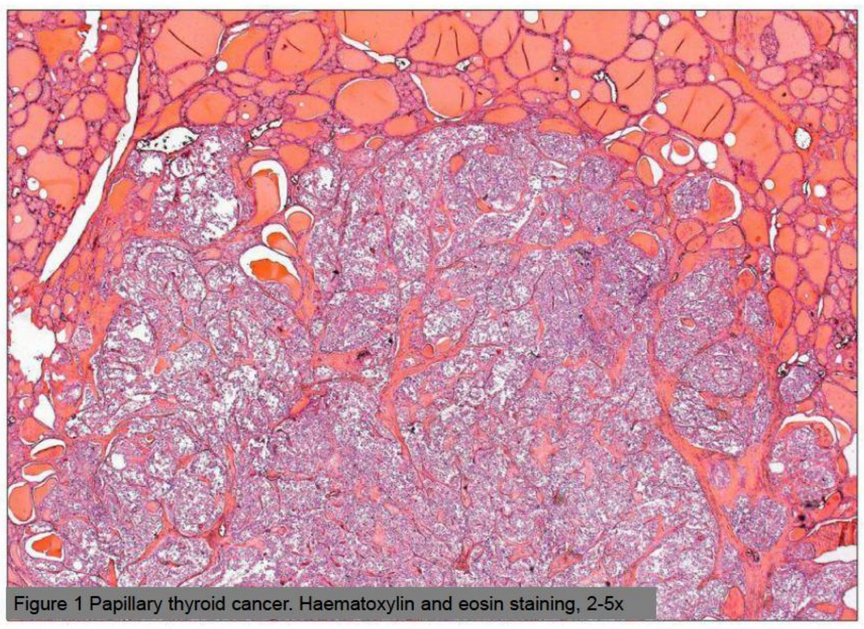

Figure 1 Papillary thyroid cancer. Haematoxylin and eosin staining, 2-5x

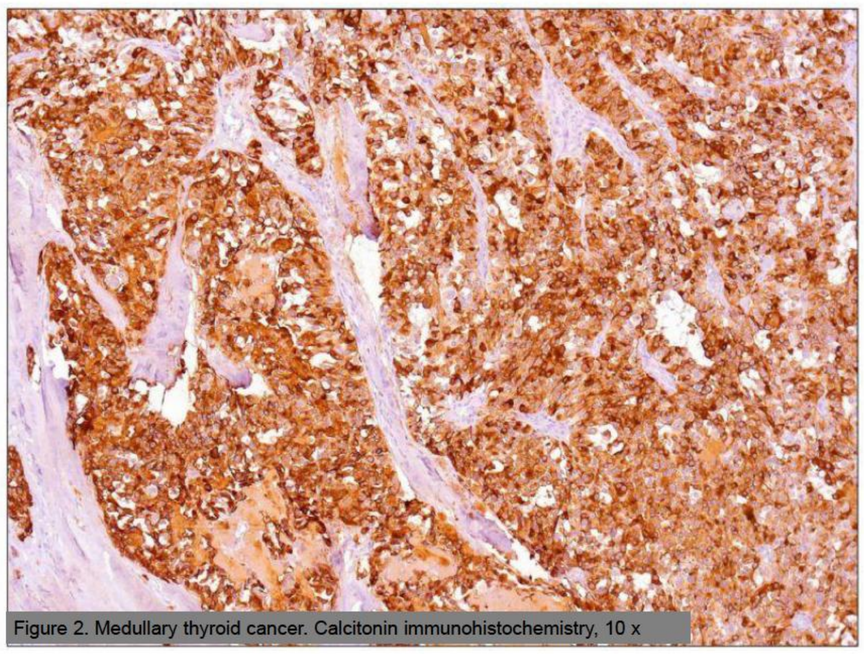

Figure 2. Medullary thyroid cancer. Calcitonin immunohistochemistry, 10 x

INTRODUCTION

Thyroid cancers represent approximately 1% of new cancer diagnoses. Thyroid malignancies are divided into papillary carcinomas (80%), follicular carcinomas (10%), medullary carcinomas (5-8%), anaplastic carcinomas (1-2%) other rare tumours (primary thyroid lymphomas and sarcomas, metastases). The main therapeutic options are surgery (mainly total thyroidectomy), radioiodine treatment, levothyroxine therapy (thyroid stimulating hormone - TSH suppression dose), others (external beam irradiation, chemotherapy, tyrosine kinase receptor inhibitors).

The co-occurence of papillary and medullary carcinoma can be a mixed medullary and follicular thyroid carcinoma (MMFTC) showing the morphological features and immunoreactivity (thyroglobulin and calcitonin) of both tumors or simple coincidence. The prevalence of the disease is 0.5-13.8 % of all thyroid malignancies due to the different data. The hypotheses of this rare entity are: common stem cell theory (ultimobranchial body, „composite thyroid carcinoma"), hostage hypothesis (non neoplastic cells entrapped by medullary carcinoma and proliferate via trophic factor stimulation), field effect theory (common neoplastic-carcinogenic stimuli, e.g. radiation exposure), collision theory (two independent tumor without any collective effect), common genetic factor (germline/somatic RET proto-oncogene mutation, somatic BRAF mutation), but there is no widely accepted clear theory of the disease.

CASE REPORT

A medical investigation was started with a 60 years old male patient due to palpable thyroid nodules without family history of endocrine/thyroid disease or radiation exposure. The thyroid ultrasonography revealed nodules in the isthmus and in both thyroid glands (diameter: 4.0, 2.7, 2.0 centimeter) without lymphadenopathy. The ultrasonography guided fine needle aspiration didn't show any malignant suspect cytological sign. The patient was euthyroid, the calcitonin level was elevated (38.5 pg/ml, normal: -9.6 pg/ml). Because of the large nodules and the suspition of medullary cancer we recommended total thyroidectomy. The histology and immunohistochemistry showed papillary microcarcinoma (4 mm)(Figure 1) in the left lobe nodule and medullary microcarcinoma (6 mm)(Figure 2) in the right lobe nodule. Levothyroxine therapy was started at substitutional dose (TSH low normal range), radioiodine treatment was not performed. During the follow-up the patient has undetectable calcitonin (<2 pg/ml) and human thyroglobulin level (<1 ng/ml) with normal anti-human thyroglobulin rate without any sign of recurrence or metastases. Genetic screening was also performed: peripherial blood leukocytes DNA for RET proto-oncogene exon 10, 11 (Figure 3) and 14 and in the tumor tissue BRAF (Figure 4), NRAS, HRAS, KRAS somatic oncogene mutation analysis were negative. The screening tests for multiple endocrine neoplasia (MEN) type 2 were negative as well.

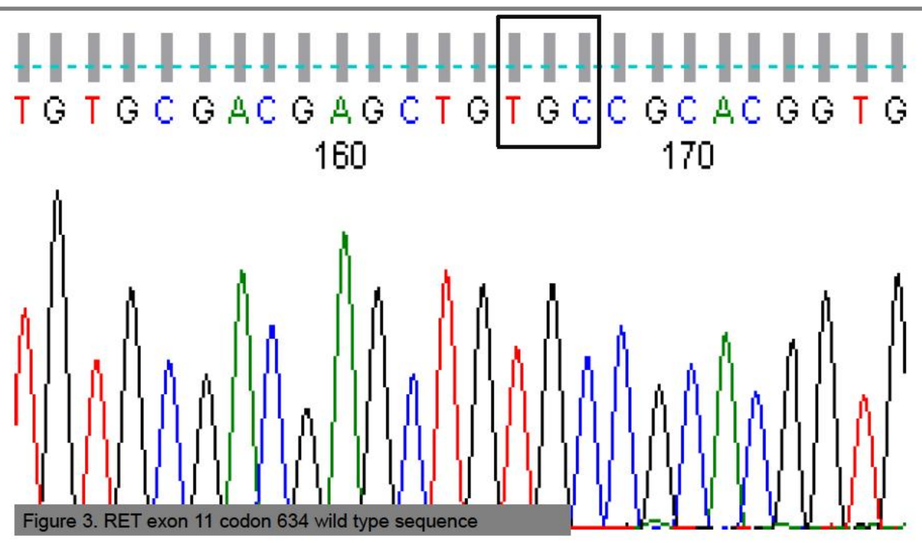

Figure 3. RET exon 11 codon 634 wild type sequence

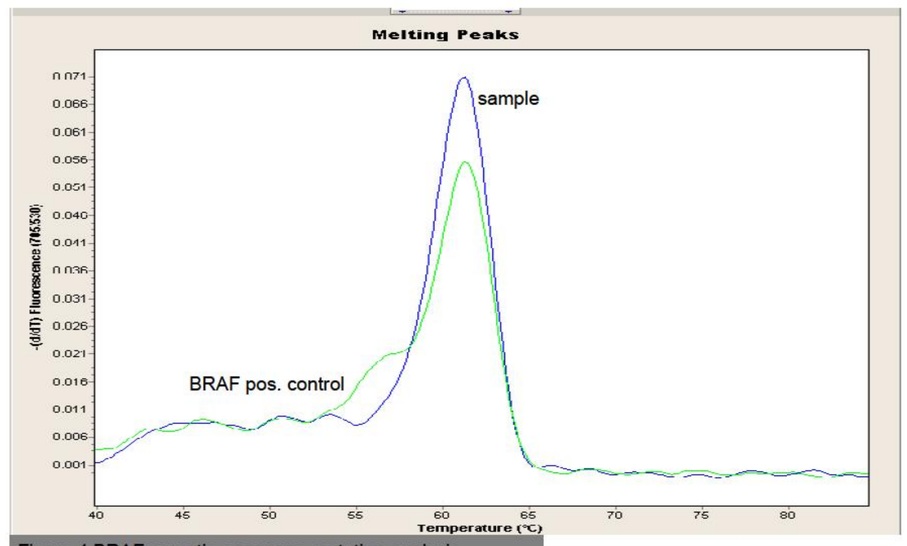

Figure 4.BRAF somatic oncogene mutation analysis

CONCLUSIONS

A simultaneous occurence of medullary and papillary thyroid microcarcinomas were detected in different nodules of the thyroid gland in our case. In the literature less than 80 similar cases were reported, most of them are collision tumor with separated tumor parts.

This case draws attention to the importance of careful pathological examination and the assessment of calcitonin measurement in the investigation of thyroid nodules.

References

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